Federal Democratic Republic of Ethiopia

EDICT OF GOVERNMENT

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ET ISO 665 (2001) (English):
OILSEEDS-DETERMINATION OF MOISTURE AND
VOLATILE MATTER CONTENT

ISO INSIDE

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(Reaffirmed:2012)

First edition

Oilseeds — Determination of moisture and volitile matter content

ICS: 67.060

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Cereals, pulses and derived products (TC 11) and published by the Ethiopian Standards Agency (ESA).

The standard is a reaffirmation for reprint of the Ethiopian Standard ES ISO 665:2001, Oilseeds - Determination of moisture and volitile matter content (Identical with ISO 665:1977), with some editorial changes without altering the technical contents in the former text.

Oilseeds — Determination of moisture and volatile matter content

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the moisture and volatile matter content of oilseeds.

2 REFERENCE

ISO 664, *Oilseeds — Reduction of contract samples to analysis samples.*

3 DEFINITION

moisture and volatile matter content : The loss in mass measured under the operating conditions specified below.

4 PRINCIPLE

Determination of the moisture and volatile matter content of a test portion either of the material as received (pure seed and impurities) or, if required, of the pure seed alone, by drying at 103 ± 2 °C in an oven at atmospheric pressure, until practically constant mass is reached.

5 APPARATUS

5.1 Analytical balance.

5.2 Mechanical mill, easy to clean, suitable for the kind of seed and allowing the latter to be ground without heating and without appreciable change in moisture, volatile matter and oil content.

5.3 Mechanical grater or, if not available, hand grater.

5.4 Flat-bottomed vessel, of metal resistant to attack under the test conditions, provided with a well fitting lid and allowing the test portion to be spread to about 0,2 g/cm^2 (for example diameter of vessel 70 mm, height 30 to 40 mm). Glass vessels with ground closures may also be used by agreement between buyer and seller.

5.5 Electric oven with thermostatic control and good natural ventilation, capable of being regulated so that the temperature of the air and of the shelves in the neighbourhood of the test portions lies between 101 and 105 °C in normal operation.

5.6 Desiccator containing an efficient desiccant such as phosphorus(V) oxide, silica gel, activated alumina, etc., and provided with a metal plate which allows vessels (5.4) to cool rapidly.

6 PROCEDURE

Make all weighings to the nearest 0,001 g.

6.1 Preparation of the test sample

6.1.1 Take an analysis sample obtained in accordance with ISO 664. If large non-oleaginous foreign bodies have been separated before the reduction of the laboratory sample, make allowance for this in the calculation (see 7.1.2). According to the requirements of the contract, use an analysis sample as received or after separation of the impurities.

6.1.2 In the case of copra, grate the product by hand or, preferably, using a mechanical grater (5.3) which allows the whole sample to be treated. When grating by hand, which does not allow all the analysis sample to be grated, endeavour to obtain a test sample which is as representative as possible and, to this end, take account of the size and colour of different fragments.

The length of the particles may exceed 2 mm, but shall not be greater than 5 mm. Mix the particles carefully and carry out the determination without delay.

6.1.3 In the case of seeds of medium size (groundnut, soya, etc.), except safflower seed, sunflower seed and cottonseed with adherent linters, grind the analysis sample in the mechanical mill (5.2), which has previously been well cleaned, until the major dimension of the particles obtained is not greater than 2 mm. Reject the first particles (about one-twentieth of the sample), collect the rest, mix carefully and carry out the determination without delay.

6.1.4 Small seeds (linseed, colza, hemp, etc.) as well as safflower seed, sunflower seed and cottonseed with adherent linters, are analysed without previous grinding.

6.2 Test portion

6.2.1 Weigh the vessel (5.4) with its lid, after leaving it open for at least 30 min in the desiccator (5.6) at laboratory temperature.

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6.2.2 Weigh into the vessel

either 5 ± 0,5 g of the grated product (see 6.1.2) in the case of copra, or meal (see 6.1.3) in the case of medium-sized seeds other than safflower seed, sunflower seed or cottonseed with adherent linters;

or 5 to 10 g of whole seed in the case of safflower seed, sunflower seed, cottonseed with adherent linters and small seeds.

Spread the material evenly over the whole base of the vessel and close the vessel with its lid. Weigh the whole.

6.2.3 Carry out these operations as quickly as possible, to avoid any appreciable change in moisture content.

6.3 Determination

Place the vessel containing the test portion, with the lid removed, in the oven (5.5), which has previously been set to operate at 103 ± 2 °C. Close the oven. After 3 h (12 to 16 h in the case of cottonseed with adherent linters), reckoned from the time when the temperature returns to 103 °C, open the oven, immediately close the vessel with its lid, and place in the desiccator. As soon as the vessel has cooled to laboratory temperature, weigh it.

Return the vessel, with the lid removed, to the oven. After 1 h, repeat the operations of closing the vessel, allowing to cool, and weighing.

If the difference between the two weighings is equal to or less than 0,005 g (for a test portion of 5 g), regard the determination as finished. If not, subject the test portion to successive 1 h periods in the oven, until the difference between two successive weighings is equal to or less than 0,005 g.

Carry out two determinations on the same test sample.

7 EXPRESSION OF RESULTS

7.1 Method of calculation and formulae

7.1.1 The moisture and volatile matter content, as a percentage by mass of the sample as received, is equal to

$$\frac{m_1 - m_2}{m_1 - m_0} \times 100$$

where

m_0 is the mass, in grams, of the vessel;

m_1 is the mass, in grams, of the vessel and test portion before drying;

m_2 is the mass, in grams, of the vessel and test portion after drying.

Take as the result the arithmetic mean of the two determinations, provided that the requirement concerning repeatability (see 7.2) is satisfied. Otherwise, repeat the determination on two other test portions. If this time the difference again exceeds 0,2 g per 100 g of sample, take as the result the arithmetic mean of the four determinations carried out, provided that the maximum difference between the individual results does not exceed 0,5 g per 100 g of sample.

Report the result to one decimal place.

7.1.2 If, before the analysis, large non-oleaginous foreign bodies have been separated from the sample (see 6.1.1), multiply the result obtained in accordance with 7.1.1 by

$$\frac{100 - X}{100}$$

where X is the percentage by mass of large impurities previously separated, in the initial material as received.

7.1.3 If the determination of moisture and volatile matter has been carried out on pure seed, calculate the moisture and volatile matter content by means of the formula given in 7.1.1.

7.2 Repeatability

The difference between the results of two determinations carried out simultaneously or in rapid succession by the same analyst should not exceed 0,2 g of moisture and volatile matter per 100 g of sample.

8 NOTE ON PROCEDURE

Never put moist products in the oven together with products that are nearly dry, as this will result in the latter being partially rehydrated.

9 TEST REPORT

The test report shall show the method used and the result obtained, indicating clearly whether this represents the moisture and volatile matter content of the material as received or that of the pure seed. It shall also mention all operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details required for complete identification of the sample.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.
Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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